

TFT LCD MODULE

0.96 inch 80RGB*160DOTS

MODULE NUMBER: **LH096TIG11**

REVISION: **A**

Customer:
Approved by

From:
Approved by

Part Number	Revision	Revision Content	Revised on
LH096TIG11	A	New	2018-03-27



1. General Description

1.1 Description

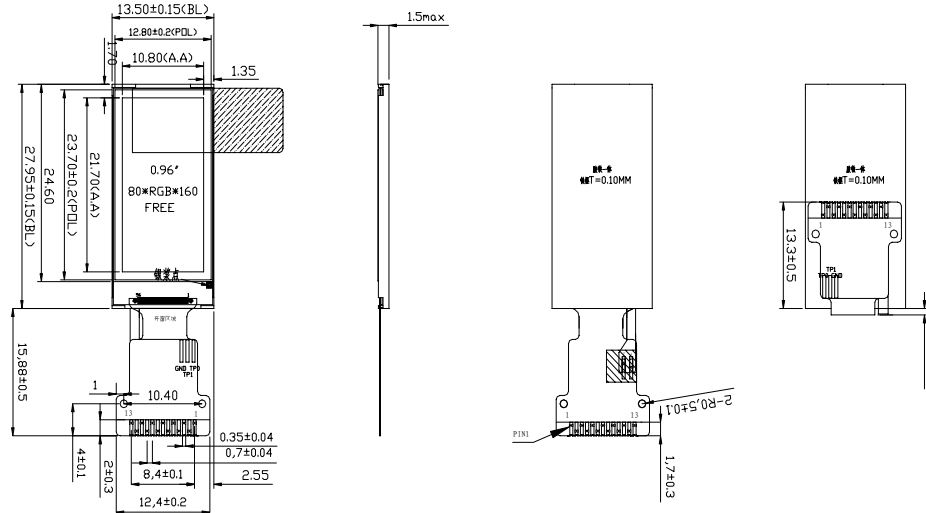
LH096T-IG11 is a 80RGBX160 dot-matrix TFT LCD module. This module is composed of a TFT LCD Panel, driver ICs, FPC and a Backlight unit.

1.2 Features

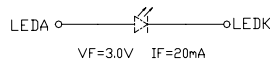
NO.	Item	Contents	Unit
1	LCD Size	0.96 inch(Diagonal)	-
2	Display Mode	Normally black	-
3	Resolution	80(H)RGB x 160(V)	-
4	Dot pitch	0.135(H) x 0.1356(V) mm	-
5	Active area	10.8(H) x 21.7(V) mm	-
6	Module size	13.5(H) x 27.95(V) x1.5Max(D) mm	-
7	Color arrangement	RGB Vvertical stripe	-
8	Interface	4 Line SPI	-
9	Drive IC	ST7735S	-
10	Luminance(cd/m2)	400 (TYP)	
11	Viewing Direction	All View	
12	Backlight	1 White LED	
13	Operating Temp.	-20°C ~ + 70°C	°C
14	Storage Temp.	-30°C ~ + 80°C	°C
15	Weight	1.1	g

2. Mechanical Drawing

Item	Date	Remark
A	20180324	Original Drawing



NO	SYMBOL
1	TPO
2	TP1
3	SDA
4	SCL
5	RS
6	RES
7	CS
8	GND
9	NC
10	VCC
11	LEDK
12	LEDA
13	GND



LED CIRCUIT DIAGRAM:

NOTES:

1. DISPLAY TYPE: 0.96" TFT
2. VIEWING DIRECTION: All
3. POLARIZER MODE: TRANSMISSIVE/NORMALLY BLACK
4. DRIVER IC: ST7735S
5. OPERATING TEMP.: -20°C~70°C
6. STORAGE TEMP.: -30°C~80°C
7. BACK LIGHT: 1 CHIP-WHITE LED; 20MA,3.0V
8. LCM Luminance: 400 CD/M2(TYP)
9. UNMARKED TOLERANCE: ±0.2
10. 建议制壳开槽可视区比 LCD A.A区单边大 0.3mm
11. 产品符合ROHS标准

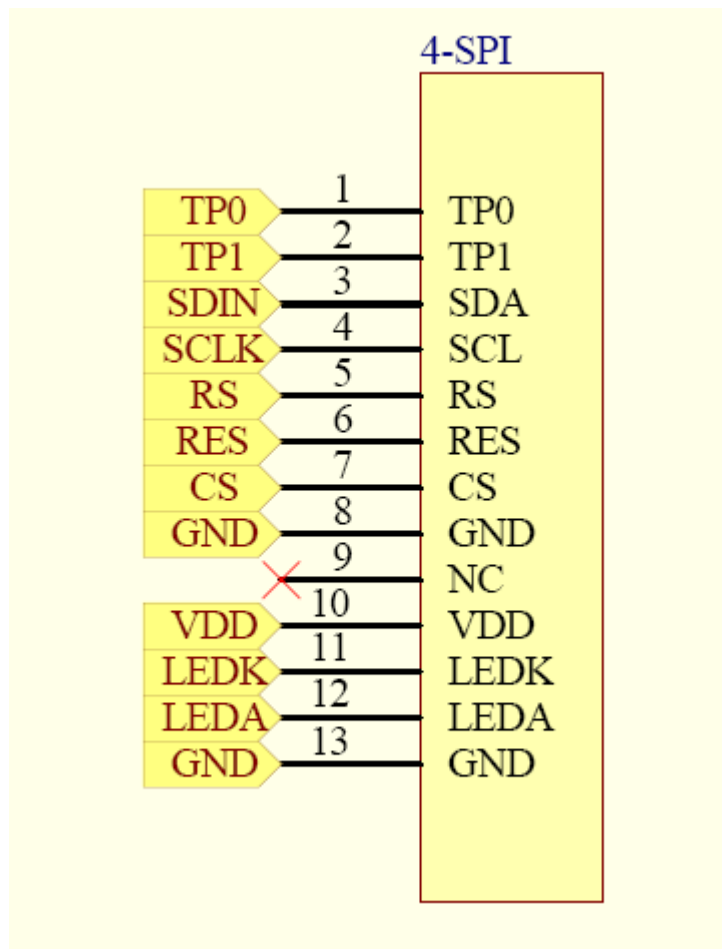
Customer Approval Signature			Drawing Number	Rev.
			0.96" TFT	A
Unless Otherwise Specified			Material	
Unit	mm	Title	Soda Lime / Polyimide	
General Roughness	±			
Tolerance		Drawn	E.E.	Panel / E.
Dimension	±0.3	By	Jesen	P.M.
Angle	±1	Date	20171216	
Scale	Sheet	Size		
1:1	1 of 1	A3		

3. Pin Definition

FPC Connector is used for the module electronics interface.

NO.	Symbol	Description
1	TP0	Touch Pin, If not used, please open this pin.
2	TP1	Touch Pin, If not used, please open this pin.
3	SDA	SPI interface input/output pin.
4	SCL	This pin is used to be serial interface clock.
5	RS	Display data/command selection pin in 4-line serial interface.
6	RESET	This signal will reset the device, Signal is active low.
7	CS	Chip selection pin, Low enable, High disable.
8	GND	Power Ground.
9	NC	No Connect.
10	VDD	Power Supply for Analog
11	LEDK	LED Canthode
12	LEDA	LED Anode
13	GND	Power Ground.

Note:



4. Electrical Characteristics

4.1 Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit	Notes
Supply Voltage (I/O)	VDD	-0.3	4.6	V	
Analog Supply Voltage	VDDIO	-0.3	4.6	V	
Logic Input Voltage	VIN	-0.3	VDD+0.3	V	
Operation Temperature	Top	-20	70	°C	
Storage Temperature	Tst	-30	80	°C	

4.2 Model Characteristics

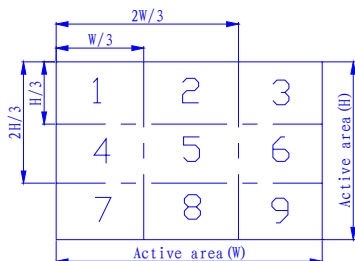
Parameter	Symbol	Min	TYP	MAX	Unit	Notes
Voltage for LED backlight	V_{bl}	2.9	3.0	3.1	V	
Supply Voltage for Logic	VDD	2.5	2.8	3.3	V	
Interface Operation Voltage	VDDIO	1.65	1.8	3.3	V	
Gate Driver High Voltage	VGH	10	-	15	V	
Gate Driver Low Voltage	VGL	-13	-	-7.5	V	
Operating Current for V _{DD}	I_{DD}	--	2	3	mA	
Current for LED backlight	I_{bl}	15	-	20	mA	1 LED
Brightness	L_{br}	350	400	--	cd/m ²	
Sleep In Mode VDD	I_{dd}	--	15	30	uA	
Sleep In Mode VDDIO	I_{ddio}	--	5	10	uA	

1 Test condition is:

- a:Center point on active area
- b:Best Contrast

2 Uniform measure condition:

- a:Measure 9 point,Measure location is show below:
- b:Uniform=(Min brightness/Max.brightness)x100%
- c:Best Contrast.



5. Optical characteristics

Item	Symbol	Measuring Conditions		Min.	Typ.	Max.	Unit	Remark
		$\theta = 0^\circ$ $\phi = 0^\circ$	25 °C					
Response Time	Tr+Tf	$\theta = 0^\circ$ $\phi = 0^\circ$	25 °C	-	30	40	ms	
Viewing Angle	θ	$\phi = 0^\circ$	25 °C	-	80	-	Deg	Note (b)
		$\phi = 180^\circ$	25 °C	-	80	-		
	θ	$\phi = 90^\circ$	25 °C	-	80	-		
		$\phi = 270^\circ$	25 °C	-	80	-		
Contrast Ratio	CR	-	25 °C		800	-	-	Note (c)
Color of CIE Coordinate	White	X	25 °C	0.304	0.306	0.308	-	-
		Y	25 °C	0.325	0.327	0.329		
	Red	X	25 °C	0.608	0.610	0.612		
		Y	25 °C	0.331	0.333	0.335		
	Green	X	25 °C	0.279	0.281	0.283		
		Y	25 °C	0.531	0.533	0.535		
	Blue	X	25 °C	0.144	0.146	0.148		
		Y	25 °C	0.136	0.138	0.140		
Transmittance (with polarizer)					5.09		%	

Note1:Definition of Response Time.(white-black)

The response time is defined as the time interval between the 10% and 90% amplitudes

6. Reliability

6.1 Contents of Reliability Tests

Item	Conditions	Criteria
High Temperature Operation	70°C, 120 hrs	The operational functions work.
Low Temperature Operation	-20°C, 120 hrs	
High Temperature Storage	80°C, 120 hrs	
Low Temperature Storage	-30°C, 120 hrs	
High Temperature/Humidity Operation	50°C, 85% RH, 120 hrs	
Temperature Cycling	-10°C ↔ 25°C ↔ 60°C ↔ 25°C, 60mins/Cycle, 12 Cycles	

Note:

No moisture condensation is observed during tests.
Condition of image sticking test : 25°C±2°C.

6.2 Shock and Vibration

Test Item	Conditions
Packing Vibration	Frequency range 10~50HZ, Stroke: 1.0mm, sweep: 10~50Hz, X,y,z 2 hours for each direction

6.3 ESD

Test Item	Conditions
ESD	150pF , 330Ω , Contact: ±2KV,
	150pF , 330Ω , Air: ±4KV

7. Package Specifications

Item	Quantity	
Module	810	per Primary Box
Holding Trays (A)	15	per Primary Box
Total Trays (B)	16	per Primary Box (Including 1 Empty Tray)
Primary Box (C)	1 ~ 4	per Carton (4 as Major / Maximum)

